TESCOE

2nd NuMI Off-Axis Experiment Detector Workshop

Argonne National Laboratory

April 25-27

Gary Feldman

Origin

- At the Stanford Workshop, I was asked to propose a method of making a choice of technologies.
- Experienced in academic procedures, I proposed appointing a committee.
- Subsequently, my punishment was being asked to chair the committee.

Name

- Stan Wojcicki suggested the name TESCOE, to stand for "TEchnical Steering Committee for the Off-axis Experiment."
- Peter Litchfield pointed out that TESCOE in the UK was equivalent to Wal-Mart.
- I took this to mean that the committee was dedicated to building a cost-effective detector.

Membership

- Prior to this meeting
  - Ed Blucher, Chicago
  - Marty Breidenbach, SLAC
  - Gary Feldman, Harvard (chair)
  - Bob Kephart, Fermilab
  - Jim Kilmer, Fermilab
  - Mark Messier, Indiana
  - Kate Scholberg, MIT
  - Mike Shaevitz, Columbia
  - Stan Wojcicki, Stanford
- At this meeting I co-opted
  - Leslie Camilleri, CERN, on sabbatical at Fermilab
  - Jeff Nelson, Fermilab
  - Adam Para, Fermilab
  - Gina Rameika, Fermilab

CostCom

- **A separate committee has been established to cost the various options.**
- **Membership:**
  - **James Grudzinski, Argonne**
  - **Bob Kephart, Fermilab**
  - **Jim Kilmer, Fermilab**
  - **Doug Michael, Caltech**
  - **Rob Plunkett, Fermilab**
  - **Dave Pushka, Fermilab**
  - **Gina Rameika, Fermilab (chair)**
  - **Rich Stanek, Fermilab**

Goal

- To recommend the technology that will
  - For a fixed physics goal, cost the least, and
  - Be buildable on a reasonable time scale, and
  - Have a high probability of meeting its technical goals.
- The physics goal I suggest at Stanford was a 3 σ discovery at the level of $\sin^2 2\theta_{13} = 0.01$.
  - Normal hierarchy (+30%)
  - $\delta = 0$ (mid-range)
  - $\Delta m_{13}^2 = 3 \times 10^{-3}$ eV^2
  - 5 years at 4×10^{20} pot/yr
- I think this should be the minimum.

Technologies

- **Liquid Argon**
  - Enormous potential, but too much schedule and technical risk to be considered for this project. R&D should be strongly encouraged.
- **RPCs and Scintillator, general issue**
  - Containers vs. monolithic
- **RPCs**
  - Full scale prototypes
- **Scintillator**
  - Mostly well understood.
  - Liquid vs. solid is an optimization
  - Understanding APDs critical for design

Timetable

- At Stanford I suggested
  - Hold a workshop in April ✔
  - Appoint a technical review committee ✔
  - Committee makes a technology recommendation to a summer workshop
  - Prepare a proposal for the November PAC meeting
- Is this the right strategy, or should we continue with two technology options?

Discussion

- Gina on costing and discussion
- Discussion of points raised
  - General issues
  - RPC issues
  - Scintillator issues
  - Timetable and strategy
  - Other issues